Amendments to the Specification:

Please replace the paragraph starting on p. 16, line 18 with the following amended paragraph:

[[A]] As described above, in one embodiment of the invention, the dithers are implemented using an amplitude modulation scheme. Embodiments of the invention are not limited to an amplitude modulation scheme and other suitable modulation schemes such as a code division multiple access (CDMA) modulation scheme are used in other embodiments of the invention. In any one of the modulation schemes each channel of the multiplexed optical signal is modulated with one or more unique dither(s) and AM_i generally refers to the power of a dither i.

Please replace the paragraph starting on p. 18, line 16 with the following amended paragraph:

At the optical splitter 210, the multiplexed optical signal S3 is split into a multiplexed optical signal OSA3 that propagates to the OSA 230 and split into a multiplexed optical signal PIN3 that propagates to the PIN detector 220. For each channel of the multiplexed optical signal OSA3 the OSA 230 measures an indicator of the channel power, P_j, (j = 1 to N where N is the number of channels) of the multiplexed optical signal M1. The OSA 230 also measures an indicator of a fractional power, $\beta_{ij}P_j$, of AM tone i present upon channel j of the multiplexed optical signal M1 (the power, $\beta_{ij}P_j$, is a fraction of the power, AM_i). In the preferred embodiment of Figure 1 the indicators are voltages and the OSA 230 converts the voltages to powers. This is discussed in more detail below with reference to Figures 4A, 4B and 5.